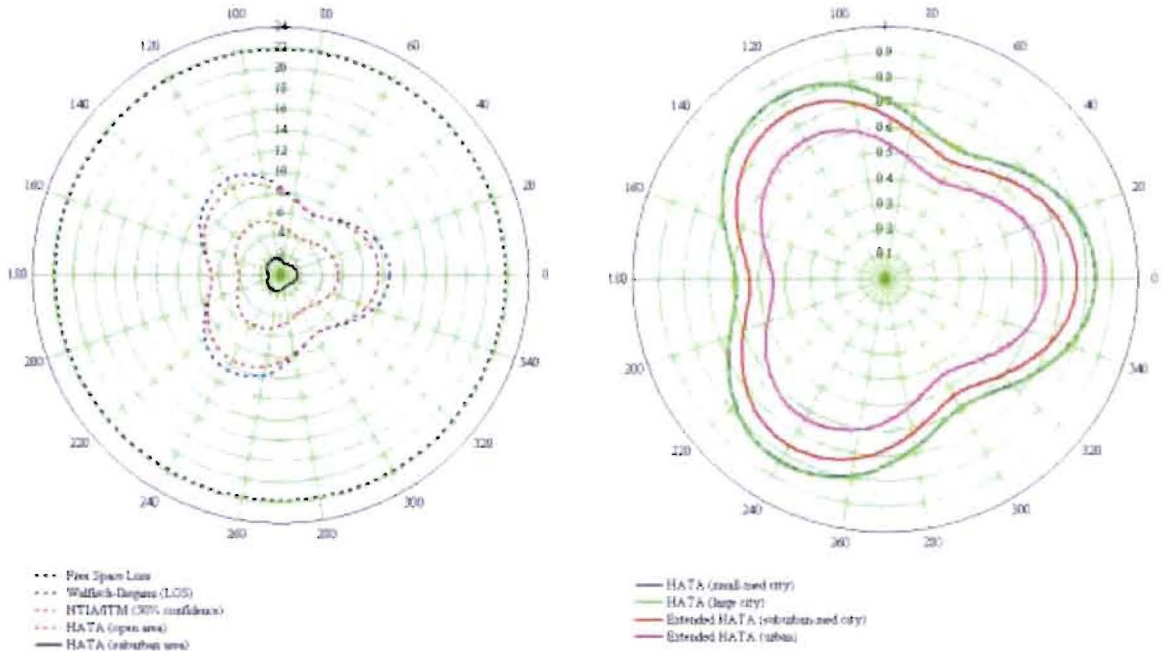


Figure 6-10. Separation Distance Contours for TRIG and Interference Threshold = -82 dBm (1 dB C/No degradation)

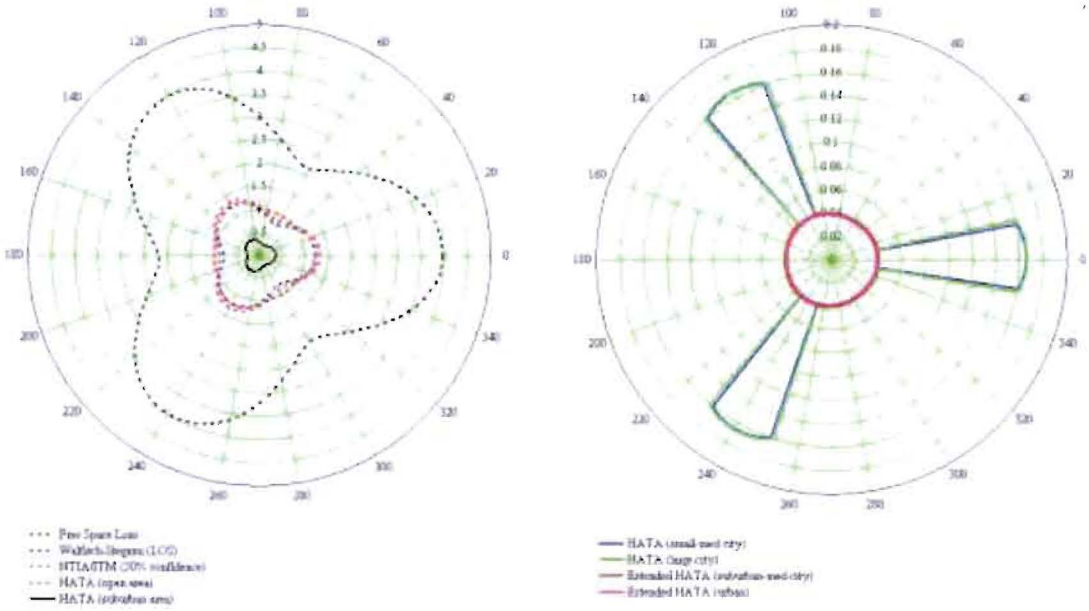


Figure 6-11. Separation Distance Contours for IGOR and Interference Threshold = -57 dBm (1 dB C/No degradation)

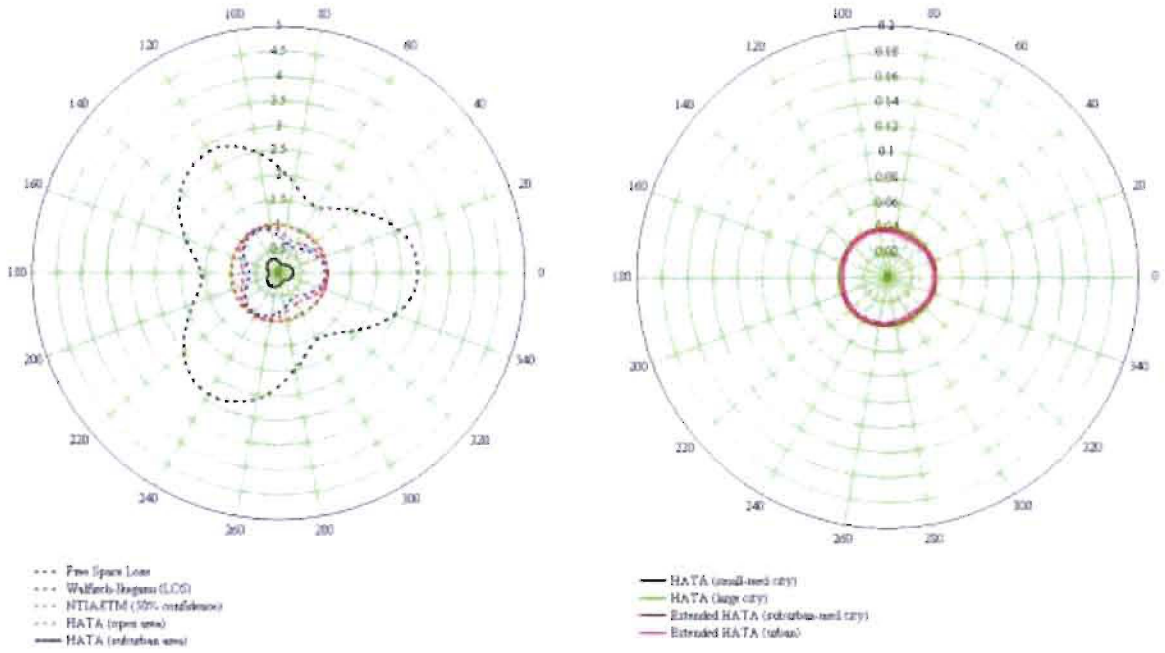


Figure 6-12. Separation Distance Contours for Receiver #15 and Interference Threshold = -54 dBm (1 dB C/No degradation)

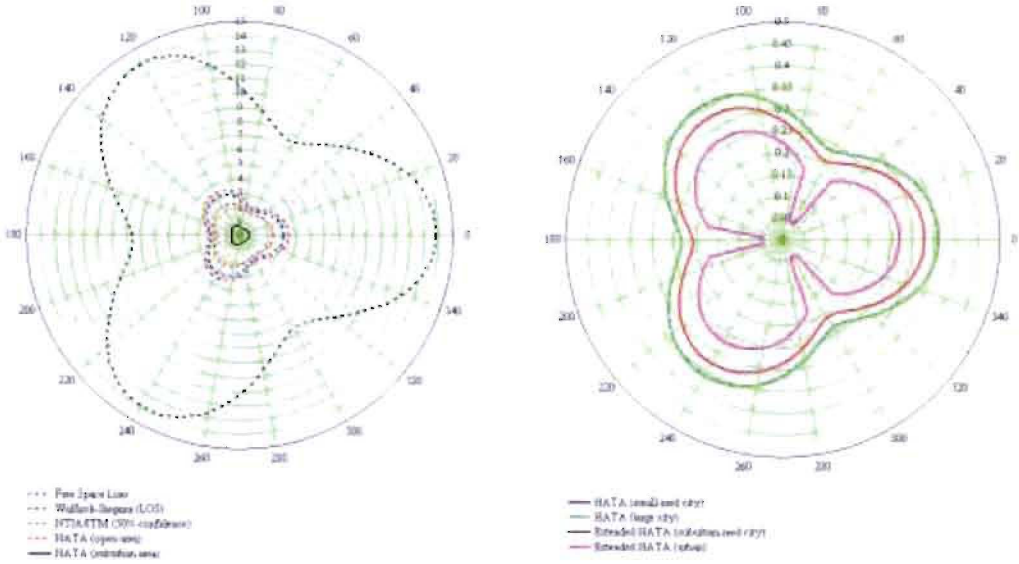


Figure 6-13. Separation Distance Contours for Receiver #16 and Interference Threshold = -68 dBm (1 dB C/No degradation)

Table 6-11. Exclusion Areas for LightSquared Las Vegas Deployment for Different Propagation Models

Note: Values are total area in which interference exceeds the 1 dB C/No degradation thresholds (-56/-68 dBm) for Receivers #15 & #16

Propagation Model	Rx #15 1 dB C/No degradation threshold	Rx #16 1 dB C/No degradation threshold
	-56 dBm	-68 dBm
Free-Space Loss	2008 km^2	3529 km^2
Walfisch-Ikegami (LOS)	532.1 km^2	1478 km^2
NTIA/ITM (50% confidence)	632 km^2	1420 km^2
Hata (open area)	424 km^2	1123 km^2
Hata (suburban)	32.4 km^2	154.8 km^2
Hata (small-med city)	5.3 km^2	34.9 km^2
Hata (large city)	5.3 km^2	34 km^2
Extended Hata (suburban-med city)	4 km^2	28.1 km^2
Extended Hata (urban)	2.6 km^2	18.3 km^2

FAA Simulation

Impact of LightSquared Emissions on Aviation

Following charts show impact for the LightSquared planned initial deployment of terrestrial base stations.

Assumptions

- Effective isotropic radiated power (EIRP) of 62 dBm/sector
    - Based upon LightSquared's stated plans
    - Importantly, the FCC has authorized 10× higher EIRPs
- Base station antenna gain patterns provided by LightSquared
- Free-space propagation modeling

What LightSquared Received Power Levels are Harmful?

FAA TSOs and ICAO SARPs both require that avionics meet all performance requirements for interference levels less than -86.4 dBm* at the LightSquared upper frequency of 1552.7 MHz

- Only require that avionics do not output hazardously misleading information with interference beyond this level

Avionics tests

- Initial testing conducted, more rigorous testing underway
- Small sample size: ~half-dozen certified receiver models owned by FAA (vs many dozen models fielded)
- Least robust receiver to LightSquared emissions based upon initial tests was Receiver #2 – significant degradation at -64 dBm and failure to produce a position output at -47 dBm
- The popular Receiver #3 began to degrade at -54 dBm and failed to produce a position output at -37 dBm

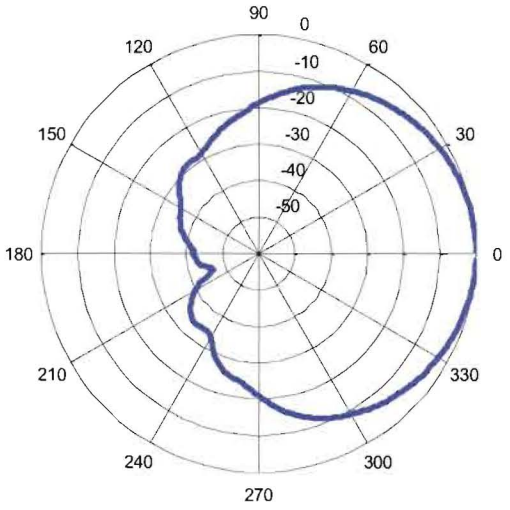
*All power levels mentioned in this subtask report are referenced to the output port of the passive airborne antenna element

Analysis Approach

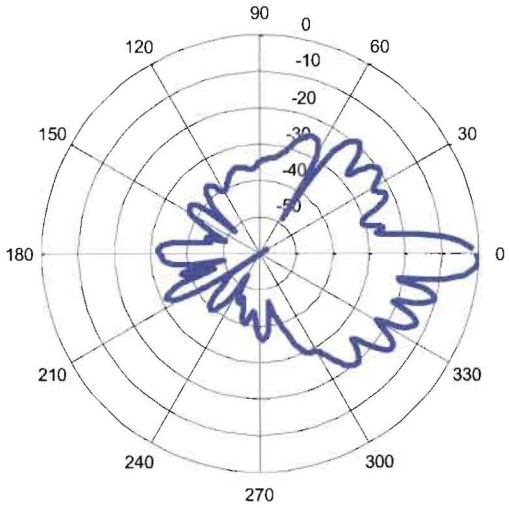
For a grid of latitude/longitudes at each stated altitude, the total power received from all visible LightSquared base stations was computed:

- Base station patterns on following chart
- Airborne GPS antenna gain pattern shown on subsequent chart
- Free space path loss
- 4/3-Earth radius model used to determine visibility
- 0.5 degree grid used for CONUS-level charts

Contours depict where total received interference exceeds either maximum tolerable level from avionics standards or a level determined to cause degradation from initial characterization testing.



Horizontal Relative Gain Pattern (dBi)

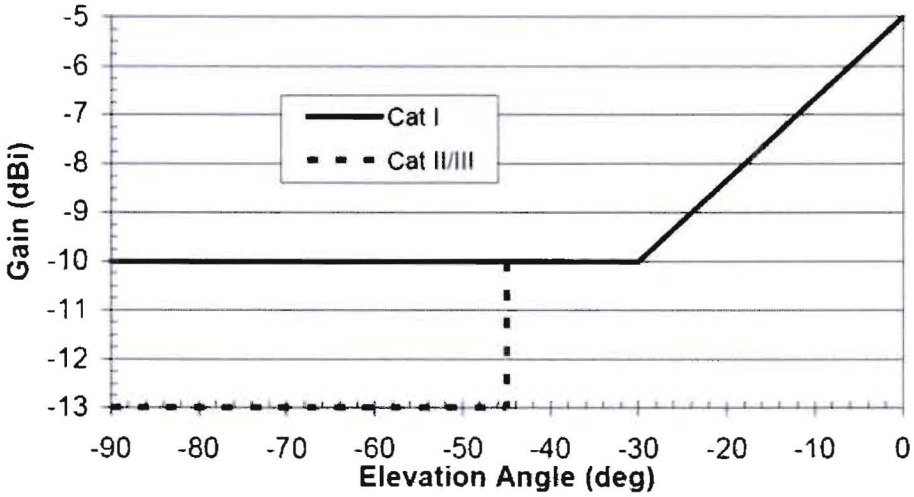


Vertical Relative Gain Pattern (dBi)

Tongyu TDJ-151717DE-65F with 2 degree electrical downtilt

Maximum gain = 16.51 dBi

Figure 6-14. Base Station Gain Patterns



Analysis utilized "CAT I" pattern shown above from RTCA DO-235B

Figure 6-15. Airborne Antenna Gain Pattern

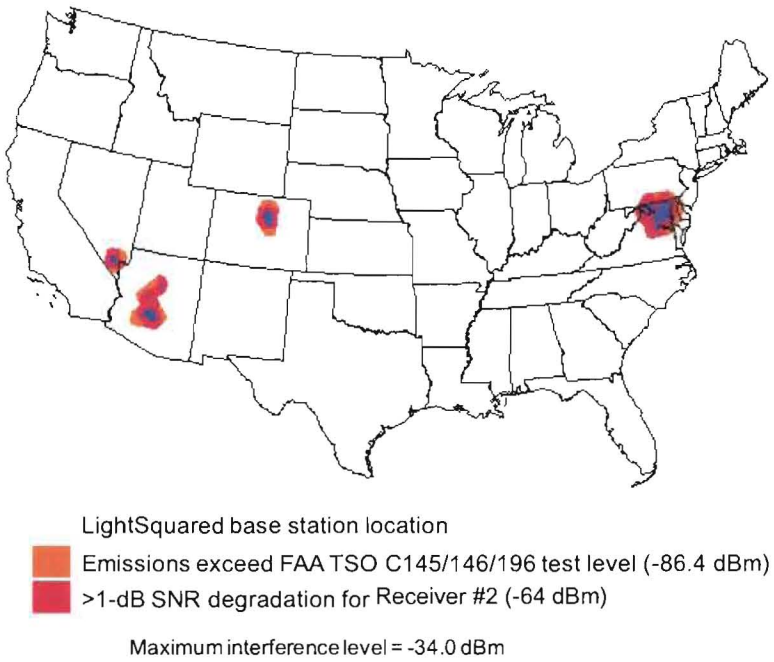


Figure 6-16. Initial LightSquared Deployment (2391 of 40000+ Towers) Aircraft at 200'

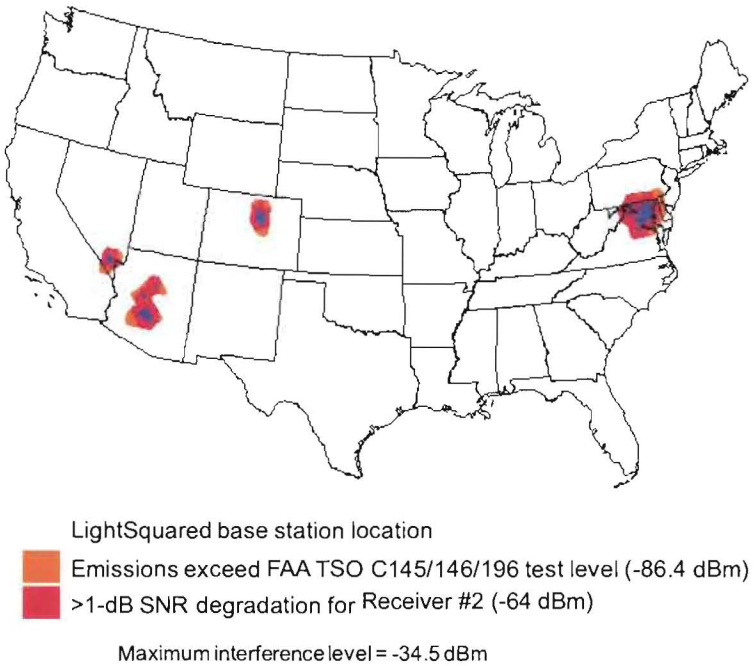


Figure 6-17. Initial LightSquared Deployment (2391 of 40000+ Towers) Aircraft at 250'

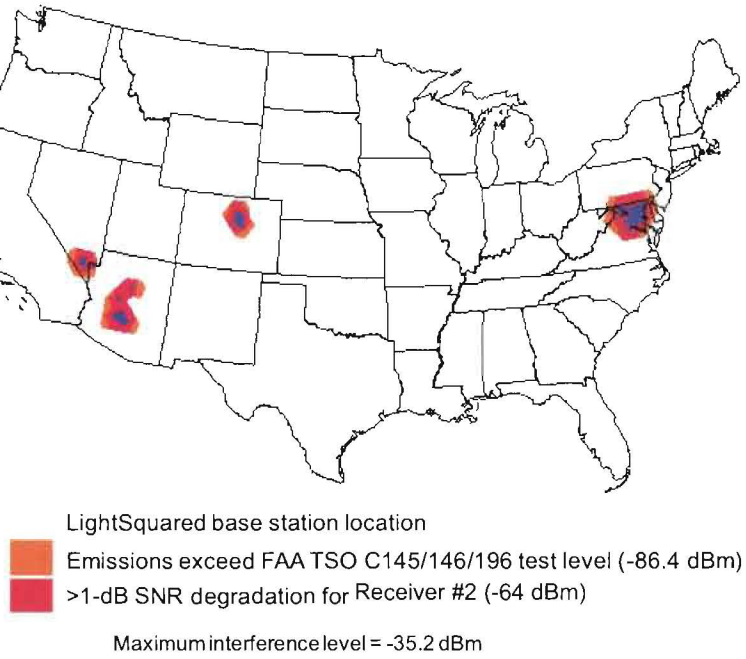


Figure 6-18. Initial LightSquared Deployment (2391 of 40000+ Towers) Aircraft at 350'

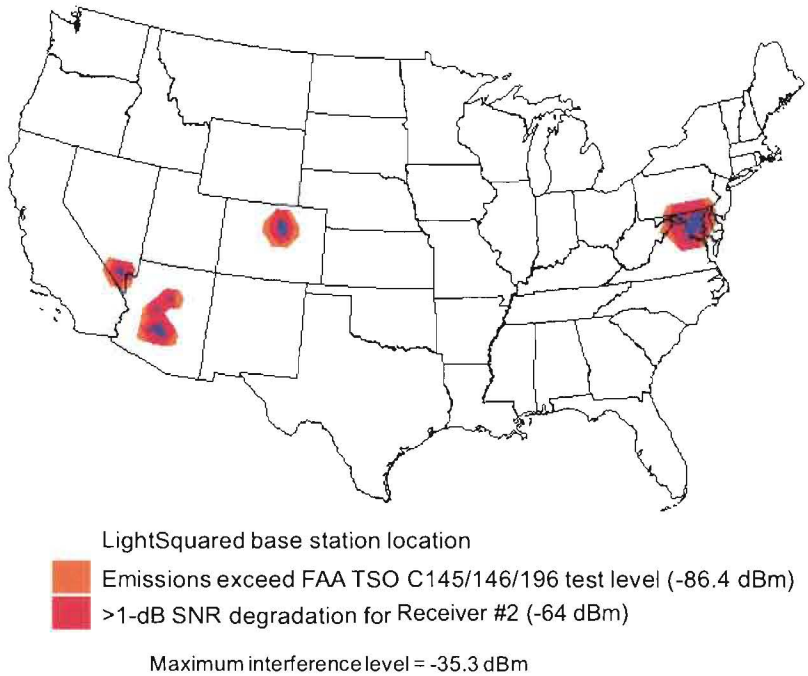


Figure 6-19. Initial LightSquared Deployment (2391 of 40000+ Towers) Aircraft at 400'